# A LIVING SPECIES OF *AUSTROTRITON* (GASTROPODA, CYMATIIDAE) FROM NEW SOUTH WALES

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Plate 6

SUMMARY

The first living species of the endemic Australian genus *Austrotriton* is described from the continental shelf off central New South Wales. It is related to an undescribed species from the uppermost Miocene of Gippsland, Victoria.

## INTRODUCTION

*Austrotriton*, an endemic Australian genus of Cymatiidæ, is represented by numerous species in the Eocene, Oligocene and Lower to Upper Miocene of Victoria, South Australia and Tasmania (*see* species described by Tate, 1888; and generic assignments by Darragh, 1970), and a small, nodulose species from the uppermost Miocene of Gippsland, Victoria, is as yet undescribed (T. A. Darragh, pers. comm.; also specimens examined at the National Museum of Victoria during September, 1969, and collected in Gippsland by T. A. Darragh and the writer). The genus was erected for the Miocene *Triton radialis* Tate, 1888 and related species by Cossmann (1903, p.98); Iredale (1914, p.459) placed the Recent Australian and New Zealand species *Septa parkinsonia* Perry, 1811 in the genus, considering it to be the living representative of the long line of Tertiary species typified by *Triton radialis* Tate. However, Finlay (1931, p.7) showed that there were two genus-group taxa in Iredale's concept of *Austrotriton*, and designated *Septa parkinsonia* as the type species of a new genus, *Austrosassia*. Several of the species described by Tate (1888), having regularly coiled, turbinate protoconchs, belong in Tertiary lineages of *Austrosassia*. All species of *Austrotriton* have irregularly coiled, variably shaped protoconchs, apparently the remnants of a primarily chitonous larval shell which was lost soon after metamorphosis to a crawling benthic juvenile. Since Finlay referred *Septa parkinsonia* to his genus *Austrosassia*, no living representatives of *Austrotriton* have been recognised, and the genus has been regarded as an extinct, endemic Australian group.

During examination of the collections of Cymatiidæ in the Australian Museum, Sydney, during August, 1969, the writer recognised an undescribed living species of *Austrotriton* in the collections made by the Commonwealth Government prawn trawling investigations with M.V. " Challenge ", from the outer half of the continental shelf off central New South Wales. The molluscan collections were assembled through various contacts late in the investigations by Mr. T. A. Garrard, of Sydney, and presented to the National Museum of Victoria and the Australian Museum. Most novelties were described by Garrard (1961), who gave the dates and localities of the prawning investigations in more detail.

The specimens of *Austrotriton* are small and finely sculptured, apart from their three rows of moderately large, sharp nodules, and closely resemble both *Austrosassia parkinsonia* (Perry) and *Sassia* (= *Phanozesta)*

*remensa* (Iredale), both of which were taken in moderate to large numbers at many stations by M.V. "Challenge". It is not surprising, then, that the specimens of *Austrotriton* remained undetected in specimen-lots of *Austrosassia* and *Sassia*.

The undescribed species of *Austrotriton* from the uppermost Miocene of Gippsland differs from the new species only in its coarser nodular sculpture, in the broader form of young shells, and in reaching a slightly larger adult size, and may be no more than a subspecies of it. The two have very similar apices of a unique form, apparently lacking protoconchs altogether. *Austrotriton woodsi* (Tenison-Woods, 1879) is a Miocene species from Victoria with a markedly different apex (bearing a prominent spike similar to that of the *Caricella* apex of the Volutidæ) but with similar rows of peripheral and basal nodules to those of the Gippsland and New South Wales species. It appears to have been the ancestor of the lineage that culminated in the living species.

The new species is named after Mr. Tom Garrard of Sydney in recognition of his personal generosity to the writer, of his useful and continuing contributions to the study of eastern Australian Mollusca, and of his collection of all the known specimens of the new species.

## TAXONOMY

### Family Cymatiidæ

### Genus *Austrotriton* Cossmann, 1903

1903. *Austrotriton* Cossmann, *Essais de Paléoconchologie Comparée*, 5: 98.

Type species (by original designation): *Triton radialis* Tate, 1888, Miocene, South Australia and Victoria.

#### *Austrotriton garrardi* n.sp.

Pl. 6, figs. 1-6; Text-fig. 1.

Shell small, with moderately tall spire, moderately long siphonal canal curved slightly towards the dorsum, moderately sloping slightly concave shoulder just covering central row of nodules on preceding whorl so that only peripheral row of nodules is visible on spire whorls, and with two rows and weakly defined third row of small but sharp-tipped nodules forming two angulations on last whorl. Varices narrow, relatively low, placed regularly every 270° around shell, with very low nodules. Upper row of nodules maintaining strength over each intervariceal space, almost always five in each space but four in last space of some specimens; well-marked gap between last nodule and succeeding varix in each intervariceal space. Lower row of nodules decreasing rapidly in strength over intervariceal space, stopping after about two thirds of space; nodules small and closely spaced, not corresponding in position with much larger nodules of upper row; seven on holotype, four to seven on paratypes. Nodules of basal row very small or absent, often represented by colour band only, up to five nodules present in last intervariceal space when developed. Other sculpture consisting of low, flat-topped, moderately widely spaced, sometimes lightly beaded spiral threads with complex, increasingly fine secondary and tertiary interstitial threads; narrow flat interspaces between finest threads crossed by extremely fine

axial growth lamellæ. Primary spiral threads grouped into twos or threes to form ill-defined cords that cross rows of nodules; about eight primary threads on base, below basal row of nodules, are raised into low cords more prominent than other spiral sculpture. Obvious first and second order threads (often indistinguishable) on holotype are: 12 on shoulder of penultimate whorl, 15 on shoulder of last whorl; four to nine below shoulder on penultimate whorl; about 13 in space between upper two rows of nodules on last whorl, about six between lower two rows of nodules, and about 20 on base. Aperture relatively small, oval; interior of outer lip may be almost smooth, with only a few fine denticles at top and bottom, or may have up to nine fine denticles over its whole length, with three fine plicæ crowded together on weak callus pad at top of canal; inner lip thin, smooth and glossy, reflected slightly over last whorl, forming a narrow false umbilical chink between canal and slight fasciole; bearing a low white callus pad on parietal wall, forming a very shallow posterior canal, and three to five fine, sharp plicæ on callus pad at top of siphonal canal. Protoconch apparently deciduous, entirely absent in all specimens, leaving apex of shell a spiral hollow of one whorl, with smooth inner sides, and with a sloping, irregular surface blocking beginning of teleconch; teleoconch spiral sculpture beginning immediately at outer edge of oblique protoconch scar; apex in all specimens thus appears broken off. Periostracum very thin, pale straw coloured, closely adherent to all sculptural details, but apparently readily lost. Colour light fawn to pale reddish brown, usually with alternating light fawn and medium reddish brown splashes on nodular cords.

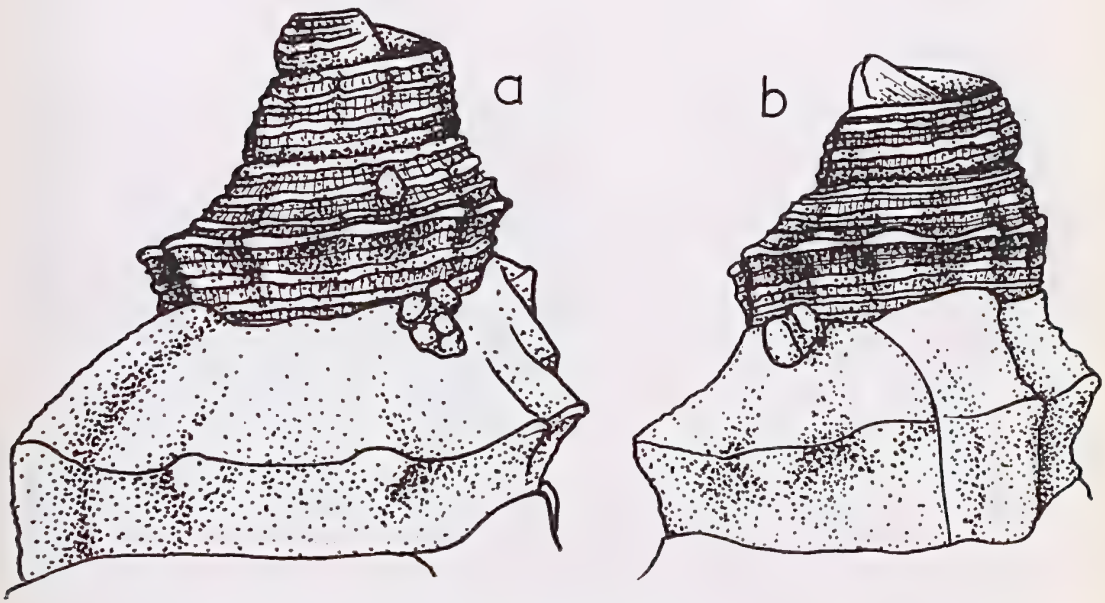



Figure 1. *Austrotriton garrardi* n. sp., apex of holotype; a — view of edge of protoconch scar; b — view of face of protoconch scar. Sculpture not shown on lowest whorl.

Dimensions of all specimens are shown in Table 1.

Table 1. — Dimensions of *Austrotriton garrardi* n.sp.

| | Height (h), mm | Diameter (d), mm | h/d |
|---|---|---|---|
| Holotype | 23.5 | 13.7 | 1.71 |
| Paratype C63399, figured | 30.8 | 16.3 | 1.89 |
| Paratype C63399 | 24.8 | 12.8 | 1.94 |
| Paratype C70101, figured | 24.7 | 13.9 | 1.78 |
| Paratype C70101 | 24.9 | 13.8 | 1.80 |
| Paratype C63413 | 25.6 | 13.8 | 1.86 |
| Paratype F27375 | 28.7 | 15.7 | 1.83 |

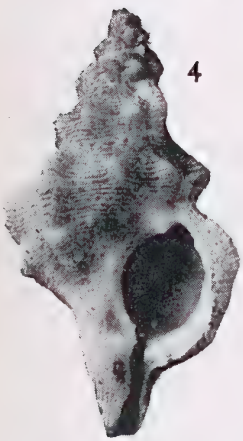
Localities: C66599, 50 fms., off Ulladulla, New South Wales, M.V. " Challenge ", pres. T. A. Garrard, holotype; C70101, 45 fms., off Broken Bay, New South Wales, M.V. " Challenge ", pres. T. A. Garrard, two paratypes; C63413, 75 fms., off Broken Bay, New South Wales, M.V. " Challenge ", pres. T. A. Garrard, one paratype; C63399, 75 fms., off Botany Bay, New South Wales, M.V. " Challenge ", pres. T. A. Garrard, two paratypes; F27375, 70 fms., off Botany Bay, New South Wales, M.V. " Challenge " pres. T. A. Garrard, one paratype.

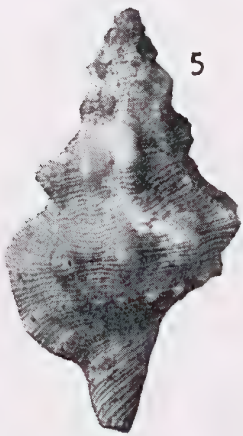
Holotype and five paratypes (C63399, C63413, C70101) in the Australian Museum, Sydney; one paratype (F27375) in the National Museum of Victoria, Melbourne.

There is some variation in colour pattern, height of spire, and strength of nodulation. The holotype has weakly developed pale bands on varices at the positions of the upper two rows of nodules, and on the tips of the nodules themselves, with medium reddish brown patches between the nodules; this pattern is very much more marked and contrasting on the larger of the two paratypes in lot C63399, but is almost identical to that of the holotype on the two paratypes in lot C70101, and is absent or nearly so in all other paratypes, which are uniform fawn to pale reddish brown in colour. The smaller of the two paratypes in lot C63399 is markedly taller and narrower than any other specimen (see Table 1); it and paratype F27375 have the central row of nodules more weakly developed than in the other specimens, and the lowest row of nodules is hardly distinguishable from the normal fine surface nodulation covering the shells.

*Austrosassia parkinsonia* is very much more abundant than *A. garrardi* in the area where the type series was taken. *Austrotriton garrardi* can readily be distinguished from *Austrosassia parkinsonia* by the absence of bristles on the periostracum; by the more prominent, sharper, and more widely spaced nodules in the peripheral row, by the more numerous, sharper, more closely spaced, and more prominent nodules of the central row, and by the presence of a basal row of small nodules below the two present in *A. parkinsonia;* by bearing up to nine fine denticles inside the outer lip, compared with the five large ones always present in *A. parkinsonia;* by bearing plicæ on the base of the inner lip; by the details of the fine spiral sculpture, which consists of alternating beaded primary and smooth secondary threads in *A. parkinsonia;* and, most obviously, by lacking the small, polyspiral, smooth, shining, turbinate protoconch of *A. parkinsonia.*



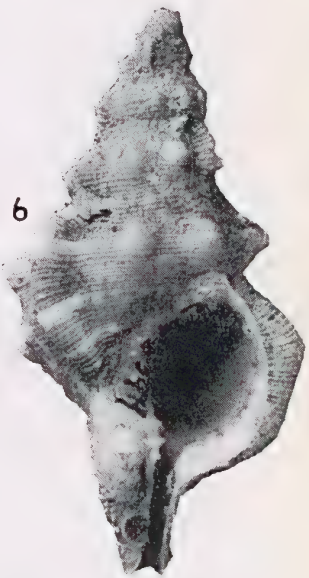




Plate 6 — *Austrotriton garrardi* n. sp.

Fig. 1-2. Holotype, X 4, whitened with ammonium chloride to show sculptural detail; 50 fms, off Ulladulla, N.S.W., M.V. " Challenge ", pres. T. A. Garrard; Australian Museum, C66599.

Fig. 3. Paratype, X 2.5; 45 fms, off Broken Bay, N.S.W., M.V. " Challenge ", pres. T. A. Carrard; Australian Museum, C70101.

Fig. 4-5. Holotype, unwhitened, X 2.5.

Fig. 6. Largest paratype, X 2.5; 75 fms, off Botany Bay, N.S.W., M.V. " Challenge ", pres. T. A. Garrard; Australian Museum, C63399.

Unfortunately all specimens of *Austrotriton garrardi* are empty shells, and appear to have been dead when collected (although some of them must have been very frshly so), so that it was not possible to examine the operculum, radula or other anatomical features of the new species. When live specimens of *A. garrardi* are collected, it will be of great importance for the understanding of phylogeny and the generic status of Australian and New Zealand Cymatiidæ to compare these features with those of *Austrosassia parkinsonia.*

## DISCUSSION

Seven specimens of *Austrotriton garrardi* were taken by M.V. " Challenge " whereas no other specimens are known to have been taken before or since. This is presumably due to the fine mesh and unusual techniques used in the prawn trawling investigations. The fact that, so far, the species appears to be restricted to the outer part of the continental shelf, in depths of 45 to 75 fms., off central and southern New South Wales, calls for some comment. The restricted depth and, for Cymatiidæ, highly restricted area of distribution of the new species indicate an extremely limited dispersal. The absence of a well-developed shelly polyspiral protoconch, usually characteristic of Cymatiidæ, and the reduced, irregular, mammillate to *Caricella*-like apex of all fossil species indicate that the major part of the larval shell of *Austrotriton* is chitinous and deciduous. Together with the great variation observed in large populations of fossil species and the large number of species that developed in a relatively short time in separate depositional basins during the Miocene, the extremely limited dispersal of *A. garrardi* and the presence of a chitinous protoconch strongly suggest that *Austrotiton* has either a very short larval life, or, more probably, direct development. This contrasts strongly with almost all other Cymatiidæ, which are well known for their wide distributions and, presumably, long planktotrophic larval lives. No species of *Austrotriton* are known from the extensive deposits and almost complete sequence of the Tertiary of New Zealand, so that it is one of very few genera of Cymatiidæ that were unable to cross the Tasman Sea.

*Austrotriton* has not yet been taken off South Australia or Victoria, despite many years of extensive trawling and dredging by May, Verco, Gatliff, Gabriel, and many other workers. As the genus was abundant in South Australia and Victoria during the Lower and Middle Miocene, and was still present during the uppermost Miocene, its present apparent restriction to New South Wales may be due either to the lowering of sea temperature during the Pleistocene, and the continuing cooler temperatures today in southern Australia than in New South Wales, or to inadequate sampling. In the uppermost Miocene of Gippsland, *Austrotriton* occurs in rich shellbeds containing some shallow-water Mollusca and lacking many of the deep-water Mollusca now occurring with *A. garrardi* such as *Sassia, Tolema, Torvamurex, Xenophora, Ficus,* and the many new forms recorded by Garrard (1961), and there can be little doubt that it was able to live in depths of the order of 10 to 20 fathoms. Thus the lineage has apparently retreated to deeper water since the Miocene.

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